PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 062002-2910	**FOR FURTHER ACTION** see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US04/38021	International filing date (*day/month/year*) 15 November 2004 (15.11.2004)	(Earliest) Priority Date (*day/month/year*) 13 November 2003 (13.11.2003)
Applicant GEORGIA TECH RESEARCH CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the Report**
   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
      ☐ The international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).
   b. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.
2. ☐ **Certain claims were found unsearchable** (See Box No. II)
3. ☐ **Unity of invention is lacking** (See Box No. III)
4. With regard to the **title**,
   ☒ the text is approved as submitted by the applicant.
   ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,
   ☐ the text is approved as submitted by the applicant.
   ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,
   a. the figure of the drawings to be published with the abstract is Figure No. 2
      ☐ as suggested by the applicant.
      ☒ as selected by this Authority, because the applicant failed to suggest a figure.
      ☐ as selected by this Authority, because this figure better characterizes the invention.
   b. ☐ none of the figures is to be published with the abstract.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US04/38021

Box IV TEXT OF THE ABSTRACT (Continuation of Item 5 of the first sheet)

The technical features mentioned in the abstract do not include a reference sign between parentheses (PCT Rule 8.1(d)).

NEW ABSTRACT

Detection systems and methods of their use are provided. An exemplary system comprises a chamber (102) for holding culture media, the chamber (102) having a cellular attachment surface (210), and a detector (104) disposed in the chamber (102) comprising a surface (214) modified with a binding agent (220) for binding a target substance wherein the detection system (104) is configured to detect interaction of the target substance with the binding agent (220). The detection can occur in either liquid or vapor phase and the subsequent action of the system is to respond in a programmed and appropriate manner to the binding event by activation of a chemical or physical responder. The system may also respond by communicating information to a control system via an alarm.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US04/38021

A. CLASSIFICATION OF SUBJECT MATTER
IPC(7) : C12Q 1/04; C12M 1/34
US CL : 435/7.2, 287.2
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
U.S. : 435/3, 7.2-7.37, 32, 33, 34, 39, 40, 287.2, 287.9; 436/525, 149; 422/68.1, 82.01; 73/54.24, 61.75

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	WO 98/40739 A1 (WILLNER et al.) 17 September 1998 (17.09.1998), see entire document	56-58, 74-82 ---------- 1-55, 67-73
X --- Y	US 4,789,804 A (KARUBE et al.) 06 December 1988 (06.12.1988), see entire document.	56-58, 74-82 ---------- 1-55, 67-73
Y	US 5,135,852 A (EBERSOLE et al.) 04 August 1992 (04.08.1992), see entire document.	1-58, 67-82
A	US 6,040,191 A (GROW) 21 March 2000 (21.03.2000), see entire document.	1-82
Y	US 5,705,399 A (LARUE) 06 January 1998 (06.01.1998), see entire document.	59-66

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
25 May 2005 (25.05.2005)

Date of mailing of the international search report
16 JUN 2005

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Form PCT/ISA/210 (second sheet) (January 2004)

INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT/IL 98/00119

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G01N33/543 G01N27/327

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 G01N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 95 32427 A (COOPER UNION FOR THE ADVANCEME ;LARUE REBECCA A (US)) 30 November 1995 see page 22, line 23 - page 23, line 12	1,4,6,9, 11,13, 16,18
X	WO 94 24561 A (NILSSON KURT ;MANDENIUS CARL FREDRIK (SE)) 27 October 1994 see page 2 - page 3	1,9,13
X	KONIG B ET AL: "A NOVEL IMMUNOSENSOR FOR HERPES VIRUSES" ANALYTICAL CHEMISTRY, vol. 66, no. 3, 1 February 1994, pages 341-344, XP000434602 see abstract	1,9,13

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of theinternational search	Date of mailing of the international search report
28 July 1998	12/08/1998

Name and mailing address of the ISA	Authorized officer
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Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT/IL 98/00119

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KOESSLINGER C ET AL: "A QUARTZ CRYSTAL BIOSENSOR FOR MEASUREMENT IN LIQUIDS" BIOSENSORS & BIOELECTRONICS, vol. 7, 1 January 1992, pages 397-404, XP000195588 see abstract	1,9,13
X	H. MURAMATSU ET AL: "Piezoelectric crystal biosensor system for detection of Escherichia coli." ANALYTICAL LETTERS, vol. 22, no. 9, 1989, pages 2155-2166, XP002072259 cited in the application see abstract	1,9,13
X	H. MURAMATSU ET AL: "Piezoelectric immuno sensor for the detection of Candida albicans microbes." ANALYTICA CHIMICA ACTA, vol. 188, 1986, pages 257-261, XP002072260 cited in the application see abstract	1,9,13
X	A. A. SULEIMAN & G. G. GUILBAULT: "Recent developments in piezoelectric immunosensors." ANALYST (CAMBRIDGE, U.K.), vol. 119, no. 11, November 1994, pages 2279-2282, XP002072261 see the whole document	1,9,13
X	B. KÖNIG & M. GRÄTZEL: "A piezoelectric immunosensor for hepatitis viruses." ANALYTICA CHIMICA ACTA, vol. 309, no. 1-3, 1995, pages 19-25, XP002072262 see abstract	1,9,13
A	WO 97 04314 A (YISSUM RES DEV CO ;WILLNER ITAMAR (IL); LEVI SHLOMO (IL); COHEN YA) 6 February 1997 see claims; examples	1,9,13
A	US 4 735 906 A (BASTIAANS GLENN J ET AL) 5 April 1988 see claims; examples	1,9,13
A	US 5 135 852 A (EBERSOLE RICHARD C ET AL) 4 August 1992 see the whole document	1,9,13
7 A	EP 0 451 687 A (MILES INC) 16 October 1991 see the whole document	1,9,13
2	-/--	

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PCT/IL 98/00119

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9532427 A	30-11-1995	US 5705399 A	06-01-1998
		JP 10504100 T	14-04-1998
WO 9424561 A	27-10-1994	EP 0648333 A	19-04-1995
WO 9704314 A	06-02-1997	AU 6317896 A	18-02-1997
		EP 0843816 A	27-05-1998
US 4735906 A	05-04-1988	NONE	
US 5135852 A	04-08-1992	CA 2064188 A	26-01-1991
		DE 69003535 D	28-10-1993
		DE 69003535 T	10-02-1994
		DK 484384 T	29-11-1993
		EP 0484384 A	13-05-1992
		ES 2060189 T	16-11-1994
		JP 4506898 T	03-12-1992
		WO 9101381 A	07-02-1991
EP 0451687 A	16-10-1991	CA 2035646 A	13-10-1991
		JP 4230861 A	19-08-1992
US 5516638 A	14-05-1996	AU 5611494 A	08-06-1994
		EP 0670042 A	06-09-1995
		JP 8503302 T	09-04-1996
		WO 9411736 A	26-05-1994